

Awareness of Cardiovascular Diseases and Knowledge of Cardiovascular Risk Factors and Risk Reduction Measures among Urban and Rural Primary School Teachers in South-Eastern Nigeria

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Abstract

Aims: To assess the knowledge of cardiovascular risk factors and reduction measures among primary school teachers in rural and urban areas in Anambra state.

Study design: Comparative Cross-sectional study.

Place and duration of study: Urban and rural primary schools in Onitsha North and Dunukofia local government areas of Anambra state between March–October 2015.

Methodology: A random sample of 320 urban and rural primary school teachers (160 in each arm) who were less than 60 years, not pregnant and not on anti-hypertensive drugs were included in the study. Data was collected using a semi-structured interviewer-administered questionnaire and focus group discussions.

Results: Were predominantly female (97.81%), mean age of 50.78±5.13 years. Awareness of cardiovascular disease was higher in urban than rural respondents (88% vs. 76%; P=0.005). Commonest source of information was TV/Radio, more in urban respondents (72% vs. 69%; P=0.008). Overall, 63.49% of respondents had high knowledge while 36.56% had low knowledge of cardiovascular disease risk factors. Most identified risk factors were lack of exercise, smoking, non-consumption of fruit/vegetables (98.75%, 96.56%, 94.38% respectively) and least identified risk factors were body site of fat deposition, physical inactivity, consumption of packaged processed food (16.25%, 11.25%, 17.19%). More urban respondents knew non-consumption of fruits/vegetables, fatty foods and stress as risk factors (P<0.000, P=0.033, P=0.006 respectively). For risk reduction measures, 61.25% had high knowledge while 38.75% had low knowledge. Regular medical check-up, cholesterol check and reduced alcohol intake (49.06%, 45.94%, and 45.63% respectively) were the most identified while 5-servings of fruit/day, regular blood sugar (16.56%, 25% respectively) were the least identified measures. Knowledge of exercising 30-minutes/day, consumption 5-servings of fruit/day, avoidance of fried foods were statistically higher in rural teachers.

Conclusion: There was high awareness of risk factors and reduction measures in rural than urban teachers with no statistical difference overall.

Keywords: Awareness; Knowledge cardiovascular disease; Risk factors; Risk reduction; Teachers

Introduction

Cardiovascular diseases (CVDs) affect the cardiovascular system and comprise cardiac diseases, vascular diseases of the brain and kidneys, and peripheral arterial diseases [1]. A number of risk factors have been noted as leading to increased chances of cardiovascular diseases. These include cigarette smoking, hypertension, physical inactivity; overweight and obesity, family history of heart disease, ethnicity, sex and age, high blood cholesterol [1-3]. Women generally have the same cardiovascular diseases risk factors as men. However, some risk factors may affect women differently than men. For example, diabetes raises the risk of cardiovascular diseases more in women.

Also, some risk factors, such as birth control pills and menopause, only affect women [4]. Most risk factors increase with age and these increase levels up at age 45-50 years in males and 60-65 years in females [4-6]. With blood cholesterol level greater than 200 mg/dl, cholesterol settles in the inner walls of vessels leading to atherosclerosis [7,8]. Nigeria when compared to most other countries has a higher prevalence of risk factors to cardiovascular disease [9]. Cardiovascular disease risk factors cannot be ignored without worsening the health indices of Nigeria, rather these risks should be well researched and its preventive strategies well understood. The risk reduction practices include the avoidance of smoking, exercise, healthy eating, avoidance or moderation of alcohol, regular medical check-up and risk assessment scoring. These risk reduction mechanisms should be taught in schools and early enough before the lifestyle posing risk to

cardiovascular diseases are developed [4]. Presently in Nigeria as in other developing countries, cardiovascular diseases are on the increase and constitute bulk of admissions in the hospitals. More worrisome is that 20% of Nigerians suffering from these diseases are unaware that they suffer from it [10]. In its bid to reflect the magnitude of the problems posed by cardiovascular diseases like hypertension and lack of its reduction practices, the World Health Organization (WHO) after the World Hypertension Day of 2012, adopted the 2013 theme of World Health Day as “Healthy Blood Pressure” with the slogan “Healthy Hearts Beat, Healthy Blood Pressure” [10]. Teachers are wide spread in every community and are seen as role models and most of the time they are the resource persons in most events especially in rural settings. Therefore, their awareness and practice will affect the entire community. Apart from the health workers, teachers are the next occupational group that must be involved if we are to rid the society of this deadly scourge. This occupational group interacts with the pupils who are yet to develop the negative lifestyle risk factors associated with developing cardiovascular disease and thus, can make primordial prevention efforts successful [11]. This they will only be able to do if they are knowledgeable about cardiovascular risk factors and risk reduction measures and in turn practice them.

Methodology

Study area

The state population is approximately 4.2 million and mainly inhabited by Igbo speaking people who are mostly Christians and most members of the population are farmers, artisans and civil servants. There are 21 local government areas in Anambra state out of which five are urban; five are semi-urban while eleven are rural. The total number of teachers in Anambra state is 10,319 in the 1043 registered primary schools in all the local government areas. Teachers in the five urban local government areas are 3,453 with an average number of 691 per urban LGA. The number of teachers in rural local government areas is 4,133 with an average number of 375 per rural LGA. There are a total of 227 schools in the urban local government, giving an average number of teachers per school as 16 (total number of teachers/ number of schools i.e., 3453/227). In the rural local governments, there are a total of 511 schools, giving an average of 8 teachers per school (total number of teachers/ number of schools, i.e., 4133/511).

Study design

This is a descriptive, comparative cross-sectional study conducted in Onitsha North LGA (urban LGA) and Dunukofia LGA (rural LGA) both in Anambra state, Southeast of Nigeria.

Sampling technique

A total of 320 primary school teachers (160 in each LGA) were studied. Teachers above 60 years of age, pregnant women, known hypertensive patients, heart disease patients and diabetics were excluded from the study. Multistage sampling technique was used to select the respondents. Stage 1: one urban and one rural LGA were selected through simple random sampling, Stage 2: 10 urban schools and 20 rural schools were selected using simple random sampling and at the third stage, teachers were selected using stratified random sampling.

Data collection and analysis

Data was collected using a pre-tested semi-structured interviewer administered questionnaire with the aid of a trained research assistant. Focus group discussions were also conducted. Knowledge on cardiovascular risk factors and risk reduction measures had a total scoring of 12 and 14 respectively with a score of +1 for a positive response, -1 for a negative response and 0 for do not know responses. Positive response on exercising for 30 minutes/day and 5-fruit servings/day were scored 2 points each. High and low knowledge was taken as knowledge greater than 50% and less than/equal to 50% of the total scores respectively. Data collected was entered and analyzed using IBM-Statistical Packages for Social Sciences Version 22 (IBM-SPSS Version 22) and analyzed after data cleaning and editing. Frequencies and percentages were presented as tables. Statistically significant differences ($P < 0.05$) were identified using a chi-square and Fisher's exact tests. Manual thematic analysis was carried out on the verbatim FGD transcripts. Some responses were quoted verbatim to capture the original ideas of the participants.

Results and Discussion

A total of 320 teachers, 160 from each of the study areas were interviewed. The socio-demographic characteristics of these respondents are presented in Table 1. One hundred and fifty seven respondents (98%) in both study arms were females and most were married with >90% having post-secondary qualifications. There were more never married participants in the urban area than in the rural area (12.5 vs. 8.8%; $P = 0.02$). The mean age was 50.78±5.13 (Age Range 38-59) with older respondents in the rural area ($P = 0.002$).

Variables	Urban (N=160) n (%)	Rural (N=160) n (%)	Total (N=320) n (%)	Test statistics χ^2	P-value
Sex					
Male	3(1.88)	4(2.5)	7(2.19)	0.146	0.276
Female	157 (98.13)	156(97.5)	313 (97.81)		
Missing					
Marital status				Fishers exact	
Never married	8(5)	20(12.5)	28(8.75)	7.819	0.026**

Married	152(95)	138(86.25)	290(90.63)		
Divorced	0	2(1.25)	2(0.63)		
Educational				Fishers exact	
FSLC	5(3.13)	4(2.5)	9(2.81)	22.767	0.02**
TCII	0	4(2.5)	4(1.25)		
OND	0	2(1.25)	2(0.63)		
HND	1(0.625)	0	1(0.28)		
NCE	18(11)	4(2.5)	22(6.88)		
BED	22(13.75)	32(20)	54(16.88)		
Postgraduate	115(71.88)	114(71.5)	229(71.56)		
Age					
Below 50 years	85 (53.13)	75 (46.88)	160 (50)	7.882	0.002*
Above 50 years	60 (37.50)	100 (62.50)	160 (50)		
Mean 50.78+5.13 Age Range 38-59					
Religion				Fishers Exact	
Roman catholic	98(61.25)	92(57.5)	190(59.38)	2.985	0.55
Anglican	45(28.13)	52(32.5)	97(30.31)		
Pentecostal	17(10.63)	14(8.75)	31(9.69)		
Traditional religion Islam	0	1(1.25)	2(0.63)		
**= Fishers Exact statistically significant					
*=Chi-square statistically significant					

Table 1: Socio demographic characteristics of respondents.

Awareness of cardiovascular diseases, source of information on CVDs and knowledge of cardiovascular disease risk factors is shown in Table 2. Awareness of cardiovascular disease was higher in urban than rural respondents (88% vs. 76%; P=0.005). Commonest source of information was TV/Radio, more in urban respondents (72% vs. 69%; P=0.008).

More rural than urban respondents identified increased alcohol intake (43.75% vs. 25%; P<0.001) and fat deposition on the waist

(22.5% vs. 10%; P=0.007) as risk factors More rural than urban respondents wrongly identified consumption of vegetables as a risk factor (10% vs. 1.25%; P<0.001) more urban teachers identified consumption of fatty foods as a risk factor (70% vs. 67.5%; P=0.033). There was no statistically significant difference in the awareness of overweight, physical inactivity, smoking, and consumption of processed packaged foods and lack of exercise between the urban and the rural respondents.

Variables	Urban (N=160) n (%)	Rural (N=160) n (%)	Total (N=320) n (%)	Test statistics χ^2	P-value
Have you heard of CVD					
Yes	141(88.13)	124(77.5)	265(82.81)	6.345	0.005*
No	19(11.88)	36(22.5)	55(17.19)		
If yes what source					
Radio/TV	102 (72.34)	86(69.36)	188 (58.75)	29.392	0.008**
Friend	16(11.35)	16(12.90)	32(10)		

Neighbor	10(7.09)	0	10(3.13)		
Newspaper	8(3.55)	0	8(2.5)		
Heath company	5(3.55)	20(16.13)	25(7.8)		
School	0	2(1.61)	2(0.63)		
	141	124			
Which of these is a risk of heart disease					
Consumption of fatty foods					
Yes	120(75)	108(67.5)	228(71.25)	2.197	0.033*
No	40(25)	52(32.5)	92(28.75)		
Consumption of processed packaged foods					
Yes	27(16.88)	28(17.5)	55(17.19)	0.022	0.116
No	133(83.13)	132 (82.5)	265(82.81)		
Consumption of fruits vegetables					
Yes	2(1.25)	16(10)	18 (5.62)	11.538	0.000**
No	158 (98.75)	144(90)	302 (94.38)		
Increased alcohol intake					
Yes	40(25)	70(43.75)	1101 (34.38)	12.468	0.000*
No	120 (75)	90.56.25	210(65.63)		
Smoking					
Yes	158(98.75)	151(94.38)	309 (96.56)	9.889	0.126
No	2(1.25)	9 (5.63)	11.(3.44)		
Exercise					
Yes	4(2.5)	4(2.5)	4(1.25)	4.038	0.061
No	156(97.5)	156(97.5)	31.6 (98.75)		
Lack of exercise					
Yes	69(43.13)	60(37.5)	129.(40.3)	1.052	0.054
No	91(56.88)	100	191 (59.69)		
Physical inactivity					
Yes	14(8.75)	22(13.75)	36 (11.25)		
No	146(91.25)	138(8.25)	284 (88.75)	2.003	0.052
Overweight					
Yes	101.(63.13)	106(66.25)	207 (64.69)	0.342	0.79
No	59(36.88)	54(33.75)	113 (35.31)		
Stress					
Yes	68(42.5)	48.(30)	116 (36.25)	5.409	0.006*
No	92(57.5)	112(70)	204 (63.75)		

Where is fat deposition most dangerous					
Arm	0	4(2.5)	4(1.25)		
Head	7(4.38)	4(2.5)	11(3.44)	20.615	0.007**
Waist	16(10)	36(22.5)	52(16.25)		
Chest	82(51.25)	84(52.5)	166(51.88)		
Legs	22(51.25)	18(11.25)	40(12.5)		
I don't know	33 (20.63)	14 (18.75)	47(14.69)		
**=Fishers Exact statistically significant					
*=Chi-square statistically significant					

Table 2: Knowledge of Cardiovascular disease risk factors.

Knowledge of cardiovascular disease risk reduction measures is shown in Table 3. More urban respondents knew the protective effects of regular blood cholesterol check than their rural counterparts (49.38% vs. 42.5%; P=0.042) More rural than urban respondents knew that exercising at least 30 minutes a day (47.7% vs. 27.5%; P<0.001),

avoidance of fried foods (38.75% vs. 30%; P=0.024) and consumption of fruits up to 5 servings per day were protective (76.25% vs. 6.88%; P<0.001). There was no difference in knowledge of smoking avoidance, weight reduction, regular medical, BP and sugar check, reduction of alcohol intake as risk reduction measures.

Variables	Urban (N=160) n (%)	Rural (N=160) n (%)	Total (N=320) n (%)	Test statistics	P-value
Which of these can reduce risk of heart disease Exercise					
Yes	51(31.88)	60(37.5)	111 (34.69)	1.117	0.054
No	109(68.13)	100 (62.5)	209(65.31)		
Exercising at least 30 minutes a day					
Yes	44(27.5)	62(47.7)	106(33.13)	12.61	0.000*
No	116(92.5)	68(52.37)	184 (57.5)		
Smoking avoidance					
Yes	62 (38.75)	58 (36.25)	120 (37.5)	0.213	0.083
No	98 (61.25)	102 (63.75)	200 (62.5)		
Reduction of alcohol intake					
Yes	76(47.5)	70(43.75)	146 (45.63)	0.453	0.71
No	84(52.5)	90(56.25)	174(54.38)		
Consumption of fruits/vegetables					
Yes	47(29.38)	38(23.75)	85(26.56)	1.298	0.53
No	113(10.63)	122(26.25)	235(73.44)		
Consumption of up to 5 servings of fruits a day					
Yes	11(6.88)	42(76.25)	53(16.56)	21.731	0.000*
No	149(93.13)	118(73.75)	267(83.44)		
Avoidance of fried foods					
Yes	48(30)	62 (38.75)	110(34.38)	2.715	0.024*
No	112(70)	98 (61.25)	210(65.63)		

Weight reduction					
Yes	61(38.13)	58(36.25)	119(37.19)	0.123	0.087
No	99 (61.88)	102 (63.75)	201(62.81)		
Regular blood pressure checks					
Yes	62 (38.75)	62	124(38.75)	0	0.546
No	98 (61.25)	99(61.2)	196 (61.25)		
Regular blood sugar test					
Yes	38 23.75	42 26.25	80 (25)	0.267	0.9
No	122 (76.25)	118 (73.75)	240(75)		
Regular blood cholesterol					
Yes	79 (49.38)	68 (42.5)	147(45.94)	1.523	0.042*
No	81(50.63)	92 (57.5)	173(54.06)		
Regular medical check up					
Yes	77 (48.13)	80(50)	157(49.06)	0.113	0.084
No	83(51.88)	80 (50)	163(50.94)		
* =Chi-square statistically significant					

Table 3: Knowledge of cardiovascular disease risk reduction measures.

Table 4 shows the overall knowledge of cardiovascular diseases factors in urban and rural primary school teachers in Anambra State. Overall knowledge was higher with the rural teachers than the urban teachers but was not statistically significant (63.44% vs. 61.88%; P=0.321).

Variables	Urban (N=160) n (%)	Rural (N 160) n (%)	Total (N=320) (%)	Test statistics χ^2	p-value
Overall Knowledge					
High	99 (61.88)	104 (65)	203 (63.44)	0.643	0.321

Low	61 (38.13)	56 (35)	117 (36.56)		
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Table 4: Overall knowledge of cardiovascular diseases risk factors among urban and rural primary school teachers in Anambra State.

Table 5 shows the overall knowledge of cardiovascular disease risk factor reduction measures among urban and rural primary school teachers in Anambra State. Overall knowledge was higher with the rural teachers than the urban teachers but was not statistically significant (64.38% vs. 58.13%; P=0.321).

Variables	Urban (N=160) n (%)	Rural (N 160) n (%)	Total (N=320) (%)	Test statistics χ^2	p-value
Overall Knowledge					
High	93 (58.13)	103 (64.38)	196 (61.25)	0.593	0.221
Low	67 (41.88)	57 (35.63)	124 (38.75)		

Table 5: Overall knowledge of cardiovascular diseases risk reduction measures among urban and rural primary school teachers in Anambra State.

Most respondents in both rural and urban locations had an idea of the meaning of cardiovascular disease and this they explained in lay terms. One of the respondents said "It is when the heart fails to perform its normal function" (Response from a rural participant). In another words a respondent explained that cardiovascular disease involves frequent tiredness. In her words "it is when the heart does not pump blood well".

On risk factors for cardiovascular disease, most respondents were able to identify the following risk factors salt intake, high cholesterol, stress and smoking and alcoholism. A female teacher in an urban area said "Another thing that causes cardiovascular disease is being under the sun for too long". Other responses on this were as follows:

"For me, it is when one eats a lot of salt"

"The risk factor is too much sleeping"

"Those that drink too much alcohol suffer it"

"I think it is because of cholesterol"

From the above, it is evident that some of the respondents have good knowledge on cardiovascular disease and cardiovascular disease risk factors.

Cardiovascular disease risk factor reduction

On cardiovascular disease risk factor reduction, responses showed that there was awareness of cardiovascular disease risk factor reduction. Respondents highlighted a number of measures that can reduce cardiovascular disease risk. Some of the responses showed that the measures were exercise, avoidance of fatty foods, and avoidance of salt and were expressed in their words as follows:

"Me I believe it's by doing exercise that one can be healthier"

"Some people eat a lot of fried foods that has fat, they should avoid it"

"Abstaining from salt intake"

"If people will reduce the way they drink alcohol, the risk will reduce"

"For me, it's by not staying near people that smoke"

Discussion

General awareness of cardiovascular disease, the knowledge of risk factors for developing cardiovascular diseases, and cardiovascular disease risk reduction measures were assessed. This study found that majority of the respondents were generally aware of CVD and this was significantly higher in urban than the rural teachers. This may have been because of access to multiple sources of information available in urban areas. This finding is similar to other studies where majority of respondents were aware of CVD [12-14]. The common source of information on CVD was from the media (radio and TV) and more urban respondents got their information through the media than their rural counterparts. Health institutions/workers as source of information were higher among rural respondents. Urban inhabitants are likely of higher socioeconomic level and can afford electronic gadgets Radio/TV was also the main source of information in a similar study in Kano, Nigeria [13]. Overall knowledge of risk factors (63.44%) was lower than that of study among university teachers in Saudi Arabia (73%) and teaching hospital staff in India (82%) but higher than that among school children in India (25.4%). This may have been because university teachers are expected to have better knowledge and exposure than primary school teachers. Also, hospital staffs are expected to have better knowledge about disease risk factors than groups outside the hospital environment. The school children's lower knowledge may be due to the fact that teachers are meant to know more [12,15,16]. Smoking was among the top three identified risk factors in our study in keeping with other studies [12,17,18]. Similar with our findings, 5-servings of fruit/day, and consumption of fruits and vegetables were the least identified risk reduction measures in a Polish study [19]. Over 70% of respondents identified consumption of fatty foods as a risk factor with statistically significant more knowledge in urban than rural respondents. Studies have shown that urban households consume more fatty foods than the rural [20] and this may account for the higher knowledge among urban teachers. Another study among military men in Northern Nigeria [13] showed that only 6.4% identified consumption of fatty foods as a risk factor for

developing CVD. The higher knowledge in the current study might be as a result of the higher educational qualification of the teachers compared to military men and the overall increased awareness in South-East Nigeria. Sixty-five percent of respondents knew overweight as a risk factor without any significant urban-rural differences in contrast to 90% seen in another study in America [21]. This may be because some of the participants in the American study had health conditions related to heart disease. More access to the media and perceived stressfulness of the urban life may have accounted for more statistically significant knowledge of the consumption of fruits and vegetables among urban teachers. Health workers/institutions being a commoner source of information on CVDs for the rural teachers may account for their statistically significant more knowledge on alcohol intake and body site of fat deposition as risk factors for CVDs. Overall knowledge of risk factor reduction measures (61.25%) was higher than 32% recorded in a study among adult Polish residents [19]. This may be because the Polish study was in a general population with varying educational levels among participants. The most identified measures were regular medical check-up, cholesterol check and reduction of alcohol intake while the least identified were 5-fruit servings and regular blood sugar check. This reflects the low awareness of the relationship of diabetes mellitus to cardiovascular disease among the teachers. Exercise, healthy food habits and smoking cessation were the most identified risk in another study [18]. While urban teachers significantly knew more about regular cholesterol check than the rural ones, the rural teachers identified exercising at least 30 minutes/day, 5-fruit servings /day and avoidance of fried foods significantly more than the urban teachers. This may be to the likelihood that cholesterol testing may be more readily available in urban than rural areas. The rural teachers may have identified the above measures more because given the nature of rural areas; exercising and fruit consumption may be practiced more there than in urban areas with lesser tendency to consume fried foods.

Conclusion

There was high awareness of risk factors and reduction measures in rural than urban teachers with no statistical difference overall. It was statistically significant that more urban respondents knew non-consumption of fruits/vegetables, fatty foods and stress as risk factors while more rural teachers knew excessive alcohol intake and the most important body site off at deposition as risk factors. Knowledge of exercising 30-minutes/day, consumption 5-servings of fruit/day, avoidance of fried foods were statistically higher in rural teachers while only regular cholesterol check was statistically higher in urban teachers. There is imperative to improve health education and awareness creation on CVDs, risk factors and risk reduction measures to teachers in both urban and rural areas of Anambra state.

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Competing Interests

The authors declare that no competing interests exist.

Authors' Contributions

OCC conceived the idea of the research. All authors contributed to the design of the study. All authors participated in data collection. OCC performed the statistical analysis, and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

Ethical Approval

Ethical approval for the study was obtained from the Ethics Committee of Nnamdi Azikiwe University Teaching Hospital, Nnewi. Informed consent was obtained from all respondents.

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